

Remarks

Claims 1-43 are pending. Reconsideration and reexamination are respectfully requested in view of the amendments and the following remarks.

The objection to the disclosure has been overcome by providing the status of the parent application.

The objection to the title of the application has been overcome by providing an amended title.

The rejection of claims 1-43 under 35 U.S.C. § 103(a) as obvious over Riebel in combination with Young is respectfully traversed. Riebel discloses a fiber-reinforced protein-based biocomposite particulate material containing a legume-based thermosetting resin and cellulosic material, and rigid biocomposite pressure-formed materials produced therefrom.

Riebel does not teach or suggest “mixing a protein hydrolysate with a synthetic resin,” as in claims 1 or 42. In Riebel, the legume-based resin is prepared and combined with cellulosic material having a moisture content of about 55-75%, the particles are dried, and fused into a rigid pressure-formed material by pressing the dry biocomposite. If a secondary thermosetting resin is to be included, the dried particles are coated with secondary thermosetting binder prior to being fused.

These methods involve: preparing an aqueous legume-based resin having a pH of about 10-14, preferably containing a colorant; and *combining a fibrous cellulosic material with the legume-based resin* in an amount and manner effective to form discrete biocomposite particles having a moisture content of about 55-75%, a particle size of no greater than about 0.5 inch (1.3 cm), and a ratio of cellulose solids to resin solids of about 0.8:10 to 1.5:1.0. These particles, preferably having a moisture content of less than about 20%, can then be fused into a rigid pressure-formed material by pressing the dry biocomposite particles under an elevated temperature and pressure, preferably a temperature of about 250°-340°F. (121°-171°C), and a temperature of about 450-750 psi. In particularly preferred embodiments, the *dried particles are coated, e.g., spray-coated, with the secondary thermosetting binder prior to fusing the particles into a rigid biocomposite pressure-formed material.*

Col. 3, lines 47-64.

The legume-based resin and cellulosic material are combined in a manner to form the high moisture-content particulate material described above. Upon drying, the particulate materials can be stored for an indefinite period of time before being formed into the pressure-

formed products. The particulate material can be formed into rigid materials under elevated pressures and temperatures. This can be done without any additional thermosetting binders other than the legume-based resin itself.

For particularly advantageous results *the dry particulate material is preferably coated with a secondary thermosetting binder*, such as an isocyanate, phenolic, melamine, or urea-containing binder.

Col. 11, lines 64 to col. 12, line 9.

*Prior to compressing the particulate material, it is preferably and advantageously coated with a secondary thermosetting binder*, i.e., an aromatic isocyanate, a sizing agent for water repellency, or a combinations thereof. *This can be accomplished by blending the dry biocomposite particles with the secondary thermosetting binder and/or sizing agent using a blender*, such as a continuous or batch-type ribbon blender or a batch-type or continuous drum blender and coating, preferably spray coating using high pressure pumps, air atomizers, mechanical atomizers (e.g., a spinning disc atomizer), or a combination thereof. *The secondary thermosetting binder interacts with the dried particles containing a protein-based resin that has been at least partially cured in the drying step of the process*. This creates a dual resin system, i.e., a partially cured protein-based resin and an isocyanate resin, which is believed to provide greater advantage than either used alone.

Col. 19, lines 31-47. See also, col. 14, lines 21-34, Tables I, V, VI, Examples 7 and 8, and Figs. 3 and 4.

Riebel teaches away from mixing the secondary thermosetting resin with the legume-based resin.

As discussed in Example 8 below, control of the moisture content of the particles is particularly important when an isocyanate is used. For example, if MDI is added to the wet particles, *through addition to the resin prior to addition of the cellulose, no significant advantage is realized in the mechanical properties of the resultant pressure-formed products*. However, if the MDI is added to the particles that are dried to a moisture content of less than about 20%, preferably less than about 15%, more preferably less than about 12% (often about 3-12%), and most preferably about 6-8%, significant advantage is realized in mechanical properties as well as physical properties.

Col. 12, lines 56-67.

Nowhere does Riebel teach or suggest “mixing a protein hydrolysate with a synthetic resin,” as claimed.

Young is cited as teaching the step of felting. Young does not remedy the deficiencies of Riebel.

Therefore, claims 1-43 would not have been obvious to one having ordinary skill in the art at the time the invention was made over Riebel in combination with Young.

Conclusion

Applicants respectfully submit that, in view of the above amendments and remarks, the application is in condition for allowance. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,  
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